



**North Carolina Department of Health and Human Services
Division of Public Health**

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March 25, 2014

Mr. Mark Piechuta
BASF Corporation
23700 Chagrin Blvd
Cleveland, OH 44122

Subject: Updated Approval to use MasterFiber MAC100 and MasterFiber MAC Matrix Structural Fibers in Precast Concrete Tanks

Dear Mr. Piechuta:

The On-Site Water Protection Branch has reviewed your modified request to use MasterFiber MAC100 and MasterFiber MAC Matrix structural fibers as an alternative reinforcement schedule to six-inch by six-inch No. 10 gage wire for precast concrete tanks approved in North Carolina. This review was completed pursuant to the provisions of Rule 15A NCAC 18A .1954(c). It appears that the MasterFiber MAC100 and MasterFiber MAC Matrix structural fibers will be capable of meeting these requirements and are hereby approved for use in precast concrete tanks based on the following information:

- a. February 11, 2014 letter from Dr. Charles Nmai, PE, with BASF Corporation based on the September 2011 report submitted to Dr. Emmanuel Attiogbe with BASF Construction Chemicals from Sean Krauss, et al with the Ira A. Fulton School of Engineering, Department of Civil and Environmental Engineering at Arizona State University specifying minimum fiber length and the minimum average residual strength of 175 psi using 4 pounds of MasterFiber MAC Matrix with a minimum 4,000 psi concrete design mix at 28 days when tested in accordance with ASTM C-1399;
- b. October 30, 2008 report submitted to Mike DeWeese with PGI from Thaddeaus Harnois, PE and Thomas Kolden, PA with Stork Twin City Testing Corporation specifying minimum fiber length and the minimum average residual strength of 175 psi using 4 pounds of MasterFiber MAC100 with a minimum 4,000 psi concrete design mix at 28 days when tested in accordance with ASTM C-1399 and the letter from October 6, 2010 letter from Dave Bye with Fabpro Performance Concrete identifying that BASF's MasterFiber MAC100 is the same fiber as Fabpro's Performax Synthetic Macro Fiber;
- c. The product information flyer "MasterFiber MAC Matrix" which specifies the fiber mixing requirements; and
- d. The product information flyer "MasterFiber MAC100" which specifies the fiber mixing requirements.

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Tanks utilizing MasterFiber MAC100 or MasterFiber MAC Matrix are to be manufactured with concrete having at least 4,000 psi compressive strength and a minimum of 4 lb/cubic yard concrete mix of MasterFiber MAC100 or MasterFiber MAC Matrix structural fibers.

Individual tank manufacturers who propose to utilize MasterFiber MAC100 or MasterFiber MAC Matrix structural fibers in place of six-inch by six-inch No. 10 gage wire must submit the following information to the On-Site Water Protection Branch:

- a. Tanks to be modified using the macro-fibers;
- b. Approved fiber(s) proposed to be used;
- c. Method to be used to mix the fibers evenly throughout the concrete;
- d. Signature indicating they have read and agree to follow the fiber manufacturers guidelines;
- e. Minimum strength of the tanks using fibers shall be 4000 psi at 28 days;
- f. Tanks utilizing macro-fibers for reinforcement may be removed from the yard at 4000 psi;
- g. Results of initial vacuum test using macro-fibers and tank manufacturer's concrete design mix.

This includes:

- i. Names of all present to witness testing, including one approved third-party person and one OSWP Branch or county health department staff member present;
- ii. The largest tank that can be made from each form shall be tested initially. (Two of each tank shall be manufactured and both shall be tested); and
- iii. Documentation showing that a vacuum of five (5) inches of mercury was pulled on the tanks and that the five inches was held for two minutes, without a loss of > 0.5 inch mercury. Deflection must not be greater than $L/240$ as measured during the vacuum testing. During the test, the tank manufacturer or their representative can seal the tank if it is found to be leaking. (Leaking that can be patched includes around the mid-seam of a tank, the top seam of a tank, around the riser, or around the pipe penetration seal. Leaks that cannot be patched include cracks in the walls, top, or bottom of the tank that produce a lack of vacuum.) The tank must be brought back up to 5 inches of mercury and held for two minutes.

Please note that this applies only to tanks constructed in accordance with previously approved plans and specifications plus these approved modifications. If any approved tank is found in noncompliance and cannot be brought into compliance with their state-approved plans or state sewage rules (15A NCAC 18A .1900, et seq.), an Operation Permit will not be issued for the installed wastewater system and such tanks may be permanently identified as being unacceptable for use in North Carolina on-site wastewater systems. In accordance with Rule .1954(e), the State shall suspend or revoke product approval upon a finding as follows:

1. The information submitted in the application is falsified,
2. The product has been subsequently altered, or
3. Subsequent experience with fiber reinforced tanks results in altered conclusions about tank performance or design.

Additionally, all tank manufacturers having North Carolina state approval of septic or pump tanks are subject to periodic, unannounced inspections of their tanks by state and local environmental health officials.

If you have any questions or comments, please feel free to contact me at 919-707-5878 or trish.angoli@dhhs.nc.gov.

Sincerely,

Tricia Angoli, PE
On-Site Wastewater Engineering